AMENDMENTS TO THE CLAIMS

1. – 17. (canceled)

18. (currently amended) A mass analyzing method using an ion trap ~~type~~ mass spectrometer which is equipped with a ring electrode and one pair of end electrodes and temporarily traps ions in a three-dimensional ~~quadupole filed~~ quadrupole field to mass-analyze a sample, comprising:

a first step of ~~apply~~ applying a main high frequency voltage to said ring electrode to form a three-dimensional quadrupole ~~filed~~ field,

a second step of generating ions in a mass-analyzing unit or injecting ions from the outside and trapping ions of a predetermined mass-to-charge ratio range in said mass analyzing unit,

a third step of applying a supplementary AC voltage having a plurality of frequency components between said end cap electrodes and scanning said main high frequency voltage, said supplementary AC voltage having a first frequency ~~components~~ component with a voltage value (V1) at least high enough to eject ions in resonance and a second frequency component with a voltage value (V2) high enough to excite ions in resonance but not high enough to eject ions in resonance,

a fourth step of scanning said main high frequency voltage and ejecting ions from said mass analyzing unit and detecting them.

19. (previously presented) A mass analyzing method in accordance with claim 18, wherein said supplementary AC voltage has a predetermined frequency band ($\omega 1$ to $\omega 2$).

20. (previously presented) A mass analyzing method in accordance with claim 18, wherein the low frequency component of said supplementary AC voltage has said voltage value V1.

21. (previously presented) A mass analyzing method in accordance with claim 20, wherein the frequency and voltage values of said supplementary AC voltage in said third step are fixed and said main high frequency voltage is swept from high voltage to low voltage.

22. (previously presented) A mass analyzing method in accordance with claim 20, wherein a step is provided between said second step and said third step to apply a wide-band noise signal to said end cap electrodes to exclude ions of a high-mass region.

23. (previously presented) A mass analyzing method in accordance with claim 18, wherein the higher frequency component of said supplementary AC voltage has said voltage value V1.

24. (previously presented) A mass analyzing method in accordance with claim 18, wherein the frequency and voltage values of said supplementary AC voltage in said third step are fixed and said main high frequency voltage is swept from low voltage to high voltage.

25. (previously presented) A mass analyzing method in accordance with claim 23, wherein a step is provided between said second step and said third step to apply a wide-band noise signal to said end cap electrodes to exclude ions of a low-mass region.

26. (previously presented) A mass analyzing method in accordance with claim 18, wherein said second frequency component is a wide-band noise component.

27. (previously presented) A mass analyzing method in accordance with claim 26, wherein said wide-band noise component is continuous.

28. (previously presented) A mass analyzing method in accordance with claim 26, wherein said wide-band noise component is discrete.

29. (previously presented) A mass analyzing method in accordance with claim 18, wherein said first frequency component is a signal frequency component.

30. (previously presented) A mass analyzing method in accordance with claim 18, wherein said first frequency is a plural frequency component.